REMARKS

Claims 1-13 are pending in the subject application with claim 1 in independent form. No claims are amended, withdrawn or cancelled in the present Response.

Claims 1-3 and 5-13 stand rejected under 35 U.S.C. §103(a) as being unpatentable over United States Pat. No. 6,518,204 to Yamakawa et al. (hereinafter "Yamakawa et al.") in view of United States Pat, Appl. Publ. No. 2002/0015748 to Miyajima et al. (hereinafter "Miyajima et al."). The Applicants acknowledge the allowability of claim 4, for which the Applicants thank the Examiner. However, because the Applicants disagree with the Examiner's rejections of claims 1-3 and 5-13, these rejections are traversed for the reasons set forth below.

With respect to claims 1, 5, 8-9 and 12-13, the Examiner contends that Yamakawa et al. discloses a curable silicone composition comprising (A) an organopolysiloxane having at least two alkenyl groups per molecule; (B) an organopolysiloxane having at least two silicon-bonded hydrogen atoms per molecule; (C) a platinum-type catalyst; and (D) a filler. The Examiner admits that Yamakawa et al. fails to disclose that the curable silicone composition may be used to seal a semiconductor device. To address this deficiency of Yamakawa et al., the Examiner relies on Miyajima et al., and opines that Miyajima et al. discloses a compression molding apparatus using a resin to seal a semiconductor device. As such, the Examiner contends that it would be obvious to utilize the curable silicone composition disclosed in Yamakawa et al. in the compression molding apparatus of Miyajima et al.

The Applicants submit that, for the reasons set forth in greater detail below, one of skill in the art, upon a full reading of the primary reference to Yamakawa et al., would have no

reason whatsoever to use the composition disclosed therein in a compression molding apparatus, such as the compression molding apparatus disclosed in Miyajima et al., to seal a semiconductor device, as claimed in the subject application. This is for the reason that Yamakawa et al. teaches a composition which forms a cured body having a non-uniform structure and low cross-link density, which is undesirable in compression molding, and also because Yamakawa et al. further teaches that a sealing resin, such as an epoxy resin, is required to seal the semiconductor device even after applying and curing the composition disclosed in Yamakawa et al.

In particular, the Applicants respectfully point out that Yamakawa et al. explicitly teaches and requires that the silicon-bonded hydrogen atoms in the organopolysiloxane must not exceed 0.05 weight percent. As readily understood by those of skill in the art, the number of silicon-bonded hydrogen atoms contributes to a cross-link density of the cured silicone body formed therefrom. As such, minimizing the number of silicon-bonded hydrogen atoms, as taught by Yamakawa et al., results in a cured silicone body having a low cross-link density, which is generally undesirable for compression molding due to the lack of hardness obtained via the low cross-link density of the cured silicone body, as understood in the art.

More specifically, Yamakawa et al. states that "[i]f the amount of hydrogen atoms exceeds 0.05 wt. % . . . it would be impossible to obtain a cured body of a non-uniform structure with the hardness of the surface layer greater than that of the inner layer. Therefore, it is recommended that the hydrogen atoms are present in an amount not exceeding 0.03 wt. % and preferably do not exceed 0.02 wt. %." (See Column 2, lines 33-40 of Yamakawa et al.). The

non-uniform silicone body of Yamakawa et al. has a surface layer with a greater hardness than the inner material. The requirement of minimal silicon-bonded hydrogen atoms is further exemplified by Comparative Examples 1 and 2 of Yamakawa et al., in which the weight percent of silicon-bonded hydrogen atoms exceeded 0.05. Comparative Examples 1 and 2 of Yamakawa et al. resulted in a cured silicone which was uniform, and thus not desirable for the purposes of Yamakawa et al. In addition, Yamakawa et al. explicitly states that, because the cured body of a non-uniform structure has minimal hardness in its interior, the composition "is suitable . . . as an adhesive agent, potting agent, or coating agent." (Column 5, lines 35-40). As such, one of skill in the art would have no reason whatsoever to select the composition of Yamakawa et al. to seal a semiconductor device, as specifically claimed in the subject application, due to the minimal hardness and non-uniform structure of the cured body taught by Yamakawa et al.

Yamakawa et al. also teaches that the ratio of alkenyl groups to silicon-bonded hydrogen atoms should be within the range of 0.01 : 1 to 1 : 1, preferably 0.05 : 1 to 0.5 : 1. (See Column 4, lines 20-25). As such, Yamakawa et al. teaches that an excess of silicon-bonded hydrogen atoms relative to alkenyl groups should be utilized to obtain a cured silicone body having a non-uniform structure. Conversely, the subject generally utilizes Component (B), i.e., an organopolysiloxane having at least two silicon-bonded hydrogen atoms per molecule, in an amount of 0.1 to 100 parts by weight for each 100 parts by weight of Component (A), i.e., an organopolysiloxane having at least two alkenyl groups per molecule (see paragraph [0072] of the subject application as published). Thus, contrary to

Yamakawa et al., which teaches the use of an excess of silicon-bonded hydrogen atoms relative to alkenyl groups, a weight excess of Component (A) to Component (B), i.e., organopolysiloxane having alkenyl groups to organopolysiloxane having silicon-bonded hydrogen atoms, is generally utilized in the subject invention.

Moreover, Yamakawa et al. itself teaches that its curable organopolysiloxane composition is not suitable for sealing a semiconductor device. In particular, the Applicants respectfully point out that Column 5, line 64 to Column 6, line 18 of Yamakawa et al. describe Figure 1 of Yamakawa et al. Specifically, this portion of Yamakawa et al. states, with respect to Figure 1:

> The illustrated semiconductor device comprises a semiconductor element 1 placed onto a circuit board 2. The semiconductor element 1 is electrically connected via a bonding wire 4 to a circuit conductor element 3 linked to an external lead wire. In a cured body 5 formed from the curable composition of the present invention, the surface layer 5 serves as a coating layer for the semiconductor element 1. The coating layer 5 that coats the semiconductor element 1, in turn, is covered with a sealing resin layer 6. The circuit board can be made from fiber-glass reinforced epoxy resin, Bakelite resin, phenol resin, or a similar organic resin; alumina or similar ceramics; copper, aluminum, or a similar metal. The circuit conductor element 3 can be made from copper, or a copper-palladium [alloy]. The bonding wire 4 can be made from gold, copper, or aluminum. Apart from the semiconductor element 1, the circuit board 2 may contain resistors, capacitors, coils, or similar elements of electronic circuits. Examples of sealing resin 6 are epoxy resin, phenol resin, polyphenylene sulfide resin, or the like. (emphasis added).

Clearly, Yamakawa et al. specifically states that a sealing resin is still necessary to seal a semiconductor device, even after applying the curable composition taught by Yamakawa et al., and the sealing resin coats the cured body formed from the curable composition of Yamakawa et al. Undoubtedly, if the cured body formed from the composition taught by Yamakawa et al.

was suitable for sealing a semiconductor device, there would be little, if any, reason to apply the sealing resin on the cured body, as taught in and illustrated by Yamakawa et al. Stated differently, if the composition taught by Yamakawa et al. was suitable for sealing a semiconductor device, Yamakawa et al. would not teach the necessity of applying a sealing resin other than the composition taught by Yamakawa et al. to properly seal a semiconductor device. Not only is the composition disclosed by Yamakawa et al. unsuitable for sealing a semiconductor device, as set forth above, but because Yamakawa et al. clearly teaches that, even after curing the composition disclosed in Yamakawa et al., a sealing resin, such as an epoxy resin, is required to seal the semiconductor device, one of skill in the art would have no reason whatsoever to use the composition disclosed by Yamakawa et al. in a compression molding apparatus, such as the compression molding apparatus disclosed in Myajima et al., to seal a semiconductor device as claimed in the subject application.

In view of the foregoing, the Applicants submit that independent claim 1, as well as claims 2-13, which depend from claim 1, are both novel and non-obvious over the prior art including Yamakawa et al. and Miyajima et al., either individually or in combination. As such, the Applicants believe the application is now in condition for allowance, and allowance is respectfully requested.

This Response is timely filed; thus, it is believed that no additional fees are due. However, if necessary, the Commissioner is authorized to charge Deposit Account 08-2789 in the name of Howard & Howard Attorneys PLLC for any additional fees or to credit the account for any overpayment.

Respectfully submitted,

HOWARD & HOWARD ATTORNEYS PLLC

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Date

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